

Application Number 10/781,118
Responsive to Office Action mailed December 28, 2006

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REMARKS

This amendment is responsive to the Office Action dated December 28, 2006. Applicant has amended claims 1, 6, 9-11, 13-15, 18, 21, 25, 30, 33, 41, 43, 48, 49, 53-55 and 57, and cancelled claim 12, 17, 34, 39, and 42. Claims 1-11, 13-16, 18-33, 35-38, 40, 41, 43-58 are pending upon entry of this amendment.

Claim Objections

The Examiner objected to claims 21, 53 and 54 due to certain typographical errors. Applicant has amended claims 21, 53 and 54 to correct the errors.

Allowable Subject Matter

In the Office Action, the Examiner objected to claims 6, 9, 11, 17, 21-23, 25 and 39 as including subject matter that would be allowable if rewritten in independent form.

In this amendment, Applicant has amended claim 1 to include all subject matter recited by claim 17 and any intervening claims. Consequently, independent claim 1 and all claims dependent therefrom are in a condition for allowance. Applicant has amended independent claim 53 in a similar manner, and is thus also in condition for allowance.

Applicant has rewritten dependent claim 6 in independent form to include all subject matter from claim 1. Consequently, claim 6 is in a condition for allowance. Applicant has amended independent claim 41, 48 and 57 in a similar manner, and are therefore also in condition for allowance.

Applicant has rewritten dependent claim 9 in independent form to include all subject matter from claim 1. Consequently, claim 9 is in a condition for allowance.

Applicant has rewritten dependent claim 11 in independent form to include all subject matter from claim 1. Consequently, claim 11 is in a condition for allowance.

Applicant has amended independent claims 41 and 48 to include subject matter from allowable claim 6 and claim 1. Applicant submits that independent claim 41 and claims dependent therefrom are in a condition for allowance.

Applicant submits that claims 1-11, 13-16, 18-33, 35-39, 41, 43-58 are in condition for allowance.

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Claim Rejection Under 35 U.S.C. § 101

The Examiner rejected dependent claims 18-20 and 36-38 rejected under 35 U.S.C. § 101 asserting that the claims are directed non-statutory subject matter and merely constitute a recitation of the mathematical process. Applicant respectfully disagrees. The rejected dependent claims inherent all features of the independent claims on which the claims depend. The independent claims recite elements that produce a useful, concrete and tangible results and are were not rejected under 35 U.S.C. § 101. Consequently, the Examiner's rejection of dependent claims 18-20 and 36-38 under 35 U.S.C. § 101 is improper and must be withdrawn.

Claim Rejection Under 35 U.S.C. §§ 102,103

In the Office Action, the Examiner rejected claim 48 under 35 U.S.C. § 102(b) as being anticipated by Hutson (U.S. Patent No. 5,490,516). The Examiner also rejected claims 1-5, 7, 8, 10, 12-16, 18-20, 24, 26, 27, 29, 31, 33-38, 40-47 and 49-58 under 35 U.S.C. § 102(b) as being anticipated by Hudson or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Hutson. The Examiner rejected claims 28, 30 and 32 under 35 U.S.C. § 103(a) as being unpatentable over Hutson in view of Malilay (U.S. Patent No. 6,396,931) or in view of Bredesen et al. (U.S. Patent No. 5,218,969).

As set forth above, Applicant has rewritten certain allowable dependent claims in independent form, and amended the independent claims to include allowable subject matter from the dependent claims. For at least these reasons the rejection of Applicant's claims in view of Hutson, Malilay and Bredesen et al. is rendered moot.

Moreover, Applicant submits that the rejections are incorrect and provides the following additional comments. In rejecting Applicant's claims, the Examiner states that the subspace disclosed in Hutson is "considered equivalent to the disease region disclosed within the instant Application." The Examiner also stated that, alternatively, "it would have been obvious to divide the subspaces of Hutson '516 by specific disease since it is the intention of the device to distinguish between diseases and enhance data analysis by means specific to each specific disease."

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Applicant disagrees. Hutson describes applying singular value decomposition to reduce noise and enhance a signal.¹ For example, Hutson states:

The present invention is used with data obtained from different medical modalities to reduce noise and unwanted signals and to enhance signals of interest. For example, it is used with ECG data to enhance the heartbeat data, allowing electrical alternans, ventricular late potentials, and other diagnostically important features in the heartbeat signals to be detected. It is used to isolate and enhance waveform structures and to improve the isolation, identification and localization of features in electroencephalograph (EEG) data. The system of the present invention improves the contrast, reduces noise, and enhances edges of conventional radiographic data. It improves wall-motion displays and enhances 3D cine-loop displays of fluoroscope and angiograph data. When used with echocardiograph data, B- and M-scan data may be correlated, or data fused, and cine-loops may be enhanced, compressed, transmitted and displayed. The present invention improves the spectral resolution of both conventional computed tomography (CT) and ultrafast computed tomography (UFCT) data, and allows for rapid "deblurring," back projection and inversion of the data for image reconstruction, as well as cine-loop enhancement. It improves the resolution, enhances contrast, reduces noise, and enhances cine-loop retrieval and display of magnetic resonance imaging (MRI) data. When used with MRI spectroscopy (MRIS) data, positron emission tomography (PET) data, or single photon emission computer tomography (SPECT) data, spectral resolution is improved and contrast is enhanced. It also enables real-time data fusion of EEG and SPECT data.²

Specifically, Hutson describes the application of SVD to a received signal for "retaining and further enhancing those singular vectors associated with features of interest and reducing or eliminating those singular vectors which are associated with interference, noise, or other unwanted components."³ To be clear, Hutson states that, for a given signal received from a patient, the diagnostician makes all the decision as to which components should be enhanced and which components should be removed. The Hutson system merely enhances the signal in response input from the diagnostician:

[A] diagnostician examining ultrasound data may be particularly interested in the data that corresponds to an organ or structure located a certain distance into the body and not interested in data that corresponds to distances beyond the structure. In such a case, the diagnostician would indicate that the weights corresponding to the distance of particular interest should be increased, and all weights corresponding to distances on

¹ D1, col. 5, lines 53-55.

² Hutson at Background.

³ *Id.*, Summary.

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either side of the structure should be decreased. The system would then set the distance weights accordingly.⁴

Although this technique allows an improved signal to be presented to the diagnostician, the Hutson system is incapable of outputting any form of diagnostic message and is incapable of detecting or suggesting an abnormal condition within a patient. Diagnosis of the signal produced by the Hutson technique is still entirely left to the medical diagnostician. Among other deficiencies, in Hutson, SVD is only applied to the signal monitored from the patient and Hutson provides no mechanism for defining the disease regions or determining how the physiological conditions relate to the multidimensional space. The Hutson system has no feature capable of distinguishing between an abnormal physiological conditions or a normal physiological condition. The Hutson system is incapable of determining whether the "enhanced components" remaining in the monitored signal indicate an abnormal physiological conditions or a normal physiological condition. The other cited references provide no suggestion to overcome the deficiencies of Hutson to achieve Applicant's claims.

CONCLUSION

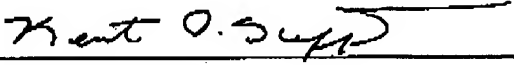
All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date:

By:

March 28, 2007

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⁴ *Id.*, col. 7, ll. 54-64.